

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

We claim:

Claims 1.–53. (Cancelled)

Claim 54. (Currently Amended) ~~Process~~ A process for the production of ergosterol ~~and its or an~~ intermediate products thereof which is squalene, farnesol, geraniol, lanosterol, zymosterol, 4,4-dimethylzymosterol, 4-methylzymosterol, ergost-7-enol or ergosta-5,7-dienol or a sterol with a 5,7-diene structure, characterized in that comprising fermenting into ergosterol with a plasmid vector-transformed microorganism, wherein said vector comprises

~~(a) — first a plasmid is designed, into which several suitable genes of the ergosterol metabolic process are inserted in altered form, wherein the catalytic area of HMG is expressed without its membrane-bonded domain; and the natural promoter of the gene t-HMG, ERG9 and SAT1 is replaced by the middle part of ADH1 promoter, in this case, the suitable genes are being selected from the following group:~~

~~a-i) first a plasmid is designed, into which the following genes are inserted:~~

- ~~i) the gene of the HMG-Co-A-reductase (t-HMG),~~
- ~~ii) the gene of the squalene synthetase (ERG9),~~
- ~~iii) the gene of the acyl-CoA: sterol-acyltransferase (SAT1), and~~
- ~~iv) the gene of squalene epoxidase (ERG1),~~

~~or~~

~~a-ii) first a plasmid is designed, into which the following genes are inserted:~~

- ~~i) the gene of HMG-Co-A-reductase (t-HMG), and~~
- ~~ii) the gene of the squalene synthetase (ERG9),~~

~~or~~

~~a-iii) first a plasmid is designed, into which the following genes are inserted:~~

- ~~i) the gene of the HMG-Co-A-reductase (t-HMG), and~~
- ~~iii) the gene of the acyl-CoA: sterol-acyltransferase (SAT1),~~

~~or~~

- a-iv) ~~first a plasmid is designed, into which the following genes are inserted:~~
- i) the gene of the HMG-Co-A-reductase (t-HMG), and
 - iv) the gene of squalene epoxidase (ERG1),
- or
- a-v) ~~first a plasmid is designed, into which the following genes are inserted:~~
- ii) the gene of squalene synthetase (ERG9), and
 - iii) the gene of acyl-CoA: sterol-acyltransferase (SAT1)
- or
- a-vi) ~~first a plasmid is designed, into which the following genes are inserted:~~
- ii) the gene of squalene synthetase (ERG9), and
 - iv) the gene of squalene epoxidase (ERG1),
- or
- a-vii) ~~first a plasmid is designed, into which the following genes are inserted:~~
- iii) the gene of acyl-coA: sterol-acyltransferase (SAT1) and
 - v) the gene of squalene epoxidase (ERG1),
- or
- (b) ~~first plasmids are designed, into which in each case~~
- a-viii) at least one of the genes of the genes mentioned under a-i) is inserted,
- and
- analyzing, purifying and isolating the fermented product.
- (c) ~~microorganisms are transformed with the thus produced plasmids, whereby~~
- ~~the microorganisms are transformed with a plasmid under a i) to a-vii) or are~~
- ~~transformed simultaneously or in succession with several plasmids under~~
- ~~b),~~
- (d) ~~fermentation into ergosterol is performed with the thus produced microorganisms,~~
- (e) ~~after fermentation is completed, the ergosterol and its intermediate products~~
- ~~are extracted from the cells and analyzed and ultimately~~
- f) ~~the thus obtained ergosterol and its intermediate products are purified by~~
- ~~means of column chromatography and isolated.~~

Claim 55. (Currently Amended) ~~Process~~ A process according to claim 4 54,
 wherein ~~in addition,~~ further comprising the gene of squalene epoxidase (ERG1) is
 inserted into the plasmid under in a-ii), a-iii), and a-v), and ~~in addition,~~ the gene of acyl-

CoA: sterol-acyl-transferase is inserted into the plasmid in a-ii).

Claim 56. (Currently Amended) ~~Process~~ A process according to claim 54 for the production of ergosterol and its intermediate products, wherein the genes in mentioned in claim 1 under a-i) to a-vii) and the genes mentioned in claim 2 under a-ii), a-iii) and a-iv) are first introduced with the plasmids, in each case independently of one another, into microorganisms of the same species, and fermentation into ergosterol is performed together with the latter, and the thus obtained ergosterol is extracted from the cells, analyzed and purified by means of column chromatography and isolated.

Claim 57. (Cancelled)

Claim 58. (Cancelled)

Claim 59. (Currently Amended) ~~Process~~ A process according to claims 1 to 3 claim 54, wherein the plasmids are the plasmids YEpH2, YDpUHK3 and pADL-SAT1.

Claim 60. (Currently Amended) ~~Process~~ A process according to claims 1 to 3 claim 54, wherein the microorganisms ~~are yeasts~~ is yeast.

Claim 61. (Currently Amended) ~~Process~~ A process according to claim 7 claim 60, wherein it said yeast is the species *S. cerevisiae cerevisiae*.

Claim 62. (Currently Amended) ~~Process~~ A process according to claim 7 claim 61, wherein it said yeast is the species *S. cerevisiae cerevisiae* AH22.

Claim 63. (Currently Amended) Yeast strain *S. cerevisiae cerevisiae* AH22, containing comprising one or more of the genes mentioned in the process under a-i) of claim 54.

Claim 64. (Currently Amended) Plasmid pADL-SAT1, A plasmid vector pADL-SAT1 consisting of the SAT1 gene and the LEU2 gene from YEp13.

Claim 65. (Currently Amended) ~~Use of the plasmids according to claim 11~~ A

process for the production of ergosterol or an intermediate product thereof which is squalene, farnesol, geraniol, lanosterol, zymosterol, 4,4-dimethylzymosterol, 4-methylzymosterol, ergost-7-enol and ergosta-5,7-dienol or a sterol with 5,7-diene structure comprising fermenting into ergosterol with a plasmid vector-transformed microorganism, wherein said vector comprises a plasmid according to claim 64.

Claim 66. (Cancelled)

Claim 67. (Cancelled)

Claim 68. (Currently Amended) ~~Expression~~ An expression cassette that comprises the average *ADH* promoter, the *t-HMG* gene, the *TRP* terminator and the *SAT1* gene with the average *ADH* promoter and the *TRP* terminator.

Claim 69. (Currently Amended) ~~Expression cassettes,~~ An expression cassette comprising the average *ADH* promoter, the *t-HMG* gene, the *TRP* terminator, the *SAT1* gene with the average *ADH* promoter, and the *TRP* terminator, and the *ERG9* gene with the average *ADH* promoter and the *TRP* terminator.

Claim 70. (Currently Amended) ~~Combination that consists of expression cassettes, and the combination that consists of~~ A combination of expression cassettes comprising

- a) a first expression cassette, on which the *ADH* promoter, the *t-HMG* gene and the *TRP* terminator are located,
- b) a second expression cassette, on which the *ADH* promoter, the *SAT1* gene and the *TRP* terminator are located,
- and
- c) a third expression cassette, on which the *ADH* promoter, the *ERG9* gene with the *TRP* terminator are located.

Claim 71. (Cancelled)

Claim 72. (Cancelled)

Claim 73. (Currently Amended) ~~Microorganisms that contain~~ A microorganism
comprising an expression cassettes according to claims ~~15 to 17~~ 68.

Claim 74. (Currently Amended) ~~Microorganisms~~ A microorganism according to
claim 20 73, wherein it ~~which~~ is yeast.

Claim 75. (Cancelled)

Claim 76. (Cancelled)

Claim 77. (New) A process according to claim 55, wherein the genes
are introduced, in each case independently of one another, into microorganisms of the
same species.

Claim 78. (New) A microorganism comprising an expression cassette
according to claim 69.

Claim 79. (New) A microorganism comprising a combination according
to claim 70.

Claim 80. (New) A microorganism according to claim 78, which is
yeast.

Claim 81. (New) A microorganism according to claim 79, which is
yeast.